

What is claimed is:

1. A stent comprising:

a plurality of annular elements, each annular element having a compressed state and an expanded state, wherein each annular element has a longitudinal dimension which is smaller in the expanded state than in the compressed state; and

at least one connecting member connecting adjacent annular elements, the connecting member operating to compensate for the smaller longitudinal dimension of the annular elements in the expanded state.

2. The stent of claim 1, wherein each annular element comprises a plurality of alternating struts and apices connected to each other to form a substantially annular configuration.

3. The stent of claim 2, wherein the connecting members are connected to the apices of the adjacent annular members.

4. The stent of claim 2, wherein the plurality of struts comprises left and right struts, with each pair of left and right struts connected to each other at an apex.

5. The stent of claim 2, wherein each strut has a longitudinal dimension which is smaller when the annular elements are in the expanded state than in the compressed state.

6. The stent of claim 2, wherein each strut has a longitudinal dimension which is larger when the annular elements are in the compressed state than in the expanded state.

7. The stent of claim 1, wherein the connecting member has a plurality of alternating segments.

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10 8. The stent of claim 7, wherein the connecting member has a plurality of alternating curved segments defining alternating top and bottom curved apices.

5 9. The stent of claim 8, wherein the plurality of alternating curved segments have a higher amplitude and a smaller wavelength than when the annular elements are in the compressed state.

10 12 10. The stent of claim 9, wherein ^{the at least one connecting} ~~the connecting~~ member has a plurality of alternating curved and straight segments.

15 13 11. The stent of claim 9, wherein ^{the at least one connecting} ~~the connecting~~ member has a plurality of alternating and angled straight segments.

20 12. The stent of claim 1, wherein the connecting member has a larger longitudinal dimension when each annular element is in the expanded state than in the compressed state to compensate for the smaller longitudinal dimension of the annular element in the expanded state.

25 13. The stent of claim 1, wherein the connecting member has a smaller longitudinal dimension when each annular element is in the compressed state than in the expanded state to compensate for the larger longitudinal dimension of the annular element in the compressed state.

30 14. The stent of claim 1, wherein the stent is made from a shape memory alloy.

15. The stent of claim 14, wherein the shape memory alloy is Nitinol.

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16. The stent of claim 1, wherein the stent has a plurality of segments along its length, each segment assuming a different diameter when the stent is in its expanded state.

5 17. The stent of claim 16, wherein the stent has a tapered configuration in which the diameter of the stent gradually changes from one segment to another segment.

10 18. The stent of claim 16, wherein the stent has a stepped configuration in which the diameter of the stent transitions abruptly from one segment to another segment.

15 19. The stent of claim 2, wherein at least one of the annular elements is closed such that the plurality of alternating struts and apices are connected to each other to form a closed annular element.

20 20. The stent of claim 19, wherein at least one of the annular elements are open such that the plurality of alternating struts and apices are not connected at at least one location.

25 21. The stent of claim 1, further in combination with a biocompatible graft covering.

25 22. A stent having a plurality of segments along its length and comprising:

25 a plurality of annular elements, each annular element having a compressed state and an expanded state;

30 at least one connecting member connecting adjacent annular elements; and

a plurality of apertures defined by adjacent annular elements and connecting members;

35 wherein the apertures of different stent segments have different sizes.

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23. The stent of claim 22, wherein each annular element comprises a plurality of alternating struts and apices connected to each other to form a substantially annular configuration, and wherein the connecting members are connected to the apices of the adjacent annular members, with the apertures defined by the adjacent struts and connecting members.

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24. The stent of claim 22, wherein each segment of the stent assumes a different diameter when the stent is in its expanded state.

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25. The stent of claim 24, wherein the stent has a tapered configuration in which the diameter of the stent gradually changes from one segment to another segment.

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26. The stent of claim 24, wherein the stent has a stepped configuration in which the diameter of the stent transitions abruptly from one segment to another segment.

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27. A stent having a plurality of segments and comprising:

a plurality of annular elements, each annular element having a compressed state and an expanded state;

at least one connecting member connecting adjacent annular elements; and

means for providing two of the plurality of segments of the stent with different degrees of flexibility.

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28. The stent of claim 27, wherein the means for providing two of the plurality of segments of the stent with different degrees of flexibility comprises a plurality of gaps formed by omitting at least one of the connecting members between adjacent annular elements.

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29. The stent of claim 27, wherein each annular element comprises a plurality of alternating struts and apices connected to each other to form a substantially annular configuration, and wherein the connecting members are connected to the apices of the adjacent annular members.

30. The stent of claim 29, wherein the means for providing two of the plurality of segments of the stent with different degrees of flexibility comprises a plurality of gaps formed by omitting at least one of the struts.

31. The stent of claim 30, wherein the plurality of gaps is further formed by omitting at least one of the connecting members between adjacent annular elements.

32. The stent of claim 27, further comprising a plurality of apertures defined by adjacent annular elements and connecting members, and wherein the means for providing two of the plurality of segments of the stent with different degrees of flexibility comprises providing the apertures of different stent segments with different sizes.

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